

**IN THE CLAIMS**

1. (Currently Amended) A method of training a neural network to perform decoding of a time-varying signal comprising a sequence of input symbols, which is coded by a convolutional coder such that each coded output symbol depends on more than one input symbol, characterized by repetitively:

providing a plurality of successive input symbols to the neural network and to the convolutional coder,

comparing ~~the network~~ outputs of the neural network with the input ~~signals~~ symbols; and  
adapting parameters of the neural network to reduce differences ~~there~~ between the neural network outputs and the input symbols;

repeating the providing, comparing and adapting steps until the differences are reduced below a threshold and the neural network substantially operates as a decoder of the convolutional coder;

wherein the input symbol is transmitted together with the plurality of output symbols to ~~a communications network~~ the decoder.

2. (Previously Presented) The method according to claim 1, further comprising supplying the neural network with the coded output symbols and at least some of the plurality of successive input symbols.

3. (Currently Amended) A method of encoded communications in which input symbols are convolutionally encoded to provide, for each input symbol, a plurality of output symbols which depend on the input symbol, and the input symbol is transmitted together with the plurality of output symbols to a communications network for decoding encoded communications in which received input symbols are convolutionally encoded to provide, for each received input symbol, a plurality of output symbols which depend on the input symbol, connected so as to feed back to ~~its~~ inputs of the network at least some of the decoded symbols ~~it the network~~ generates at its outputs, wherein at least one of the decoded symbols corresponding to the input symbol and the plurality of output symbols is output from the network, and at least one of the input symbols

is transmitted to the ~~neural~~ network together with the coded output symbols, and fed to ~~its~~ the inputs of the network together with the fed-back decoded symbols.

4. (Currently Amended) A neural network for decoding encoded communications in which input symbols are convolutionally encoded to provide, for each input symbol, a plurality of output symbols which depend on the input symbol, connected so as to feed back to ~~its~~ inputs of the network at least some of the decoded symbols it generates at its outputs, wherein at least one of the decoded symbols corresponding the input symbol and the plurality of output symbols is output from the network, and at least one of the input symbols is transmitted to the communications network decoder together with the coded output symbols, and fed to its inputs together with the fed-back decoded symbols.

5. (Cancelled)

6. (Previously Presented) The neural network according to claim 4, further comprising a programmable signal processing device programmed to perform a plurality of neuron computations on a received signal.

7. (Previously Presented) The neural network according to claim 4, further comprising an integrated circuit having a plurality of neuron computation devices operating to perform neuron computations in parallel.

8. (Previously Presented) A communication terminal operable to communicate selectively over a communications channel in a plurality of different communications modes, comprising a data processing device for processing time-varying signals, said data processing device being arranged to implement the neural network according to claim 4.

9. (Previously Presented) The communication terminal according to claim 8, wherein the communications terminal device is operable to add a new communication mode by receiving new parameter values via said communication channel.

10. (Previously Presented) A communication station for use in a system including a the communication terminal according to claim 9, the station comprising means for transmitting a signal comprising the new parameter values for neural computations, to add a new communication mode to said communication terminal.